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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,647	02/03/2004	Jeffrey K. Levasseur	AMPC 5046	8782

7590 03/12/2007
Legal Office
(AMSAM-L-G-I)
Mr. Dayn T. Beam
U.S. Army Aviation and Missile Command
Redstone Arsenal, AL 35898-5000

EXAMINER

TRAN, KHANH C

ART UNIT	PAPER NUMBER
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2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/774,647

Applicant(s)

LEVASSEUR ET AL.

Examiner

Khanh Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02/03/2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because "*the unlabeled rectangular boxes shown in the Drawings (FIGS. 1-6) should be provided with descriptive text labels*". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 16 is objected to because of the following informalities: claim 16 should be depended on claim 15 because "the means for intelligently electing the reference channel" is claim 15 limitation. Appropriate correction is required.

3. Claim 17 is objected to because of the following informalities: claim 16 should be depended on claim 15 because "the means for selecting the reference channel" is claim 15 limitation. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raleigh et al. U.S. Patent 6,101,399.

Regarding claim 1, Raleigh et al. invention is related to the formation of antenna beam patterns (beamforming), and more particularly to a technique for adaptive transmit beamforming based on the result of adaptive receive beamforming.

FIG. 5 illustrates a flow chart of determining an optimum transmit weight vector by using a transmit criteria in conjunction with network agreement criteria. In column 24 lines 45-60, Raleigh et al. teaches an implementation of the calibration equalizer and channelizer 250, which utilizes M sets of N narrowband calibration equalizers 390; see also FIG. 11.

Raleigh does not explicitly disclose the step of intelligently selecting from the available operating channels a reference channel, which produces improved equalization.

However, in column 16 line 49 via column 17 line 30, see also FIG. 5, Raleigh et al. teachings call for selecting an optimum channel frequency for a desired user transmission quality based on network agreement criteria. Because selecting an optimum channel frequency for a desired user transmission quality based on network agreement criteria would improve the equalization, one of ordinary skill in the art at the time the invention was made would have recognized that the act of selecting an optimum frequency for a desired user transmission quality based on network agreement criteria would correspond to the claimed step of intelligently selecting from the available operating channels a reference channel, which produces improved equalization.

Regarding claim 2, as disclosed in column 17 lines 1-30, Raleigh et al. further teaches when the transmitted signal power begins to encroach upon the constraints set by the network agreement criteria (e.g., desired receiver power nears fixed lower bound), it will typically be desired that communication with the desired user be switched

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to a new frequency. In view of the foregoing disclosure, the optimum frequency would be selected based on the constraints set by the network agreement criteria. And therefore, the desired frequency has the best cancellation ratio in relation to co-channel interference.

Regarding claim 3, in column 17 lines 10-25, Raleigh et al. teaches the evaluation of transmitted signal power in view of the network agreement criteria will be regularly repeated after communication has been established with the desired mobile unit to update the optimum frequency based upon the constraints set by network agreement criteria. In column 21 lines 20-65, Raleigh et al. teaches a transmit and receive channel calibration to correct for differences in the amplitude and phase match between the signal paths through the transceiver corresponding to each antenna element of the frequency channels. Because Raleigh et al. further suggests that the match between the RF transmitter 52 and the array assembly is also *determined for each transmit frequency of interest*, one of ordinary skill in the art at the time the invention was made would have been motivated to perform transmit and receive channel calibration for each transmit frequency of interest.

Regarding claim 4, in column 24 lines 55-67, FIG. 12 depicts a transmitter calibration equalizer & channel combiner 250 in another embodiment in which the equalization function is performed separately for each channel prior to the frequency multiplexing operation. Specifically, a separate set of M narrowband calibration

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equalizers 410 is seen to be coupled to each transmission beamformer 370. In turn, the N calibration equalizers 410, coupled to a set of the M channel combiners 360, are each operative to produce an equalized signal on each of the N available frequency channels. In light of the foregoing disclosure, during each calibration cycle, each of the N available frequency channels are sampled and equalized to produce equalized signals.

Regarding claim 5, claim is rejected on the same ground as for claim 3 because similar scope.

Regarding claim 6, claim is rejected on the same ground as for claim 4 because similar scope.

Regarding claim 7, claim limitation has been discussed in claim 1 rejection.

Regarding claim 8, claim is rejected on the same ground as for claim 2 and further in view of claim 4 because similar scope.

Regarding claim 9, claim is rejected on the same ground as for claim 1 because similar scope. Furthermore, in column 26 lines 35-60, Raleigh teaches a receive processor and vector processor for performing the evaluation of transmitted and received signals, and updating channel frequency.

Regarding claim 14, claim is rejected on the same ground as for claim 4 because similar scope.

Regarding claim 15, claim is rejected on the same ground as for claim 7 because similar scope.

Regarding claim 16, claim is rejected on the same ground as for claim 2 and further in view of claim 4 because similar scope.

Regarding claim 17, claim is rejected on the same ground as for claim 2 and further in view of claim 4 because similar scope.

Allowable Subject Matter

5. Claims 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Schneider et al. U.S. Patent 7,042,953 B2 discloses "Method And Arrangement For Compensating Signal Echoes During Duplex Data Transmission With Discrete Multitone Modulation".

Aoyagi U.S. Patent 4,677,647 discloses "Synchronization Of Multi-channel Receiver Based On Higher Quality Channels".

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

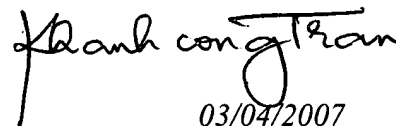
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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KCT

A handwritten signature in black ink, appearing to read "Khanh cong Tran". The signature is fluid and cursive, with the first name "Khanh" and last name "Tran" being more legible than the middle name "cong".

03/04/2007

Khanh Tran

Primary Examiner, AU 2611